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19. (Amended) A method for interfacing with a voxel-based virtual object in a haptic virtual environment, comprising:

generating a voxel-based virtual object comprising a virtual surface in the haptic virtual environment;

setting a constraint geometry in the haptic virtual environment;

determining a virtual tool for use by the user in the haptic virtual environment;

sensing a location of a user in real space;

determining a haptic interface location in the haptic virtual environment in response to the location of the user in real space;

determining a position of the virtual tool in the haptic virtual environment in comparison to the haptic interface location and the location of the virtual surface and the constraint geometry;

constraining an action of the virtual tool based on (i) the constraint geometry, (ii) the virtual surface, (iii) the position of the virtual tool, and (iv) the haptic interface location.

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